

What is claimed is:

Subc 7  
1. A thermal-acoustic insulation material comprising a wool-like carbon fiber aggregate composed of carbon fibers having an average fiber diameter of 0.5  $\mu\text{m}$  to 5  $\mu\text{m}$  and an average fiber length of 1 mm to 15 mm, and wherein said  
5 fibers are bonded together by a thermosetting resin.

describes a property  
2. A thermal-acoustic insulation material as in claim 1, wherein a galvanic current is 10  $\mu\text{A}$  or lower in a galvanic cell comprising an electrode composed of said thermal-acoustic insulation material, the other electrode composed of an aluminum plate, and an electrolytic solution composed of 0.45  
10 wt.% aqueous sodium chloride solution.

3. A thermal-acoustic insulation material as in claim 1 or 2, which has a bulk density of from 3  $\text{kg/m}^3$  to 10  $\text{kg/m}^3$ .

4. A thermal-acoustic insulation material as in one of claims 1 to 3, which has a maximum tensile strength of 1.0  $\text{g/mm}^2$  or higher.

15 5. A thermal-acoustic insulation material as in one of claims 1 to 4, which has a compression recovery rate of 70 % or higher.

6. A thermal-acoustic insulation material as in one of claims 1 to 5, wherein a minimum tensile strength of the orthogonal direction to said maximum tensile strength is 0.04 times or higher as said maximum tensile strength and, at the same time, a tensile strength of the orthogonal direction to  
20 both the direction of said maximum tensile strength and the direction of said minimum tensile strength is 0.76 times or higher as said maximum tensile strength.

7. A thermal-acoustic insulation material as in one of claims 1 to 6,  
25 which has a thermal conductivity of 0.039  $\text{W/m}\cdot^\circ\text{C}$ . or lower.

a 8. A thermal-acoustic insulation material as in claims 1 to 7, wherein a vertical incident acoustic absorptivity at a frequency of 1000 Hz of said thermal-acoustic insulation material with a thickness of 25 mm is 48 % or higher.

5 9. A thermal-acoustic insulation material as in one of claims 1 to 8, wherein said carbon fibers are produced from anisotropic pitch obtained by polymerizing condensed polycyclic hydrocarbon.

Sub 10. A method of manufacturing a thermal-acoustic insulation material, comprising the steps of:

10 a spinning step of producing spun fibers by heating and melting anisotropic pitch obtained by polymerizing condensed polycyclic hydrocarbon, then discharging melted matter out of a spinning nozzle and at the same time, blowing a heated gas from around the spinning nozzle in the same direction to which the melted matter is discharged;

15 a carbon fiber manufacturing step of manufacturing non-galvanic-corrosive carbon fibers by infusibilizing spun fibers and thereafter carbonizing the fibers at not less than 650 °C. but less than 750 °C.;

a spraying and accumulating step of accumulating said non-galvanic-corrosive carbon fibers onto a plane so as to form a wool-like material with spraying  
20 thermosetting resin solution to said fibers; and

a heat-forming step of forming said wool-like material with applying heat.

Sub 11. A method of manufacturing a thermal-acoustic insulation material as in claim 10, wherein said spraying and accumulating step comprises an accumulating step of accumulating said non-galvanic-corrosive carbon fibers so  
25 as to form a wool-like material of accumulated carbon fibers and a spraying step

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of spraying a thermosetting resin solution to said wool-like material of accumulated carbon fibers.

12. A method of manufacturing a thermal-acoustic insulation material as in claim 10 or 11, wherein a method of accumulating said carbon fibers in said spraying and accumulating step or said accumulating step is characterized by accumulating said carbon fibers by dropping said carbon fibers opened by the air from a height of at least 100 cm or higher onto a plane.

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13. A method of manufacturing a thermal-acoustic insulation material as in claim 11 or 12, wherein said wool-like material of accumulated carbon fibers has a bulk density of  $1.3 \text{ kg/m}^3$  or lower.

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